AMENDMENTS TO THE CLAIMS

The following listing of claims will replace all prior versions and listings of claims in the application.

LISTING OF CLAIMS

1. (previously presented) A method of controlling commutation of an electric motor, comprising:

using a stator having a plurality of spaced apart field windings that define a plurality of commutation regions therebetween;

disposing an armature coaxially relative to said stator and forming said armature with a plurality of radially extending posts defining a plurality of winding slots therebetween;

segmenting a first coil into first and second series coupled coil portions that are wound in first and second offset slot pairs, and with predetermined numbers of winding turns, such that a magnetic axis of said first coil is shifted angularly in a first direction from a center of said first coil;

segmenting a second coil into first and second series coupled coil portions that are wound in said third and fourth slot pairs, and with predetermined numbers of winding turns, that are offset by at least one slot position from said first and second slot pairs, respectively, such that a magnetic axis of said second coil is shifted angularly in a second direction relative to a center of said second coil that is opposite to said first direction ; and

electrically exciting said first and second coils such that said coils begin and complete commutation within coincident, overlapping commutation regions.

2. (original) The method of claim 1, further comprising:

segmenting a third coil into first and second series coupled subcoil portions; and

winding said subcoil portions of said third coil into said third and fourth slot pairs such that no offsetting of said third coil occurs relative to said second coil.

3. (previously presented) A method for controlling commutation of a two coil-per-slot electric motor, comprising:

forming a stator having a plurality of spaced apart field coils defining a plurality of magnetic neutral zones;

forming an armature having a plurality of radially extending posts defining a plurality of winding slots therebetween;

segmenting a first coil into first and second subcoil portions;

winding said first subcoil portion in a first pair of said slots;

winding said second subcoil portion in a second pair of said slots that are offset by at least one slot position from said first pair of slots;

said subcoil portions of said first coil defining a magnetic axis that is angularly shifted in a first direction from a center of said first coil;

segmenting a second coil into first and second series coupled subcoil portions;

winding said first subcoil portion of said second coil in a third pair of slots that are offset from said first pair of slots;

winding said second subcoil portion of said second coil in a fourth pair of slots that are offset from said second pair of slots;

said subcoil portions of said second coil defining a magnetic axis that is angularly shifted in a second direction from a center of said second coil that is opposite to that of said first direction; and

electrically exciting said coils such that each begins and completes commutation at common angular points to define coincident, overlapping commutation regions.

4. (previously presented) The method of claim 3, further comprising:

segmenting a third coil in first and second series coupled subcoil portions; and

winding said subcoil portions of said third coil into said third and fourth pairs of slots with said subcoil portions of said second coil such that complete overlapping of said second and third coils is achieved.

5. (original) The method of claim 4, further comprising:

segmenting a fourth coil in first and second series coupled subcoil portions;

winding said subcoil portions of said fourth coil into fifth and six pairs of said slots that are offset by at least one slot position from said third and fourth pairs of said slots, respectively.

6. (previously presented) A method of reducing at least one of brush arcing and electromagnetic interference in an electric motor, comprising:

using a stator having a plurality of spaced apart field coils that define a plurality of commutation zones therebetween;

disposing an armature coaxially relative to said stator;

segmenting a first coil into first and second series coupled coil portions that are wound on said armature in first and second offset slot pairs of said armature such that a magnetic axis of said first coil is angularly offset in a first direction, relative to a center of said first coil;

segmenting a second coil into first and second series coupled coil portions that are wound in third and fourth slot pairs of said armature that are offset by at least one slot position from said first and second slot pairs, respectively, such that a magnetic axis of said second coil is angularly offset in a second direction, relative to a center of said second coil, wherein said second direction is opposite to said first direction; and

electrically exciting said first and second coils, each of said first and second coils such that each commutates within coincident, overlapping commutation zones.

7-11. (cancelled)

12. (previously presented) The method of claim 6, wherein segmenting said first coil into first and second series coupled coil portions comprises segmenting said first and second coil portions into subcoils having differing numbers of winding turns.

13. (previously presented) The method of claim 6, wherein segmenting said second coil into first and second series coupled coil portions comprises segmenting said first and second coil portions of said second coil into subcoils having differing numbers of winding turns.

14. (previously presented) The method of claim 6, further comprising a third coil having first and second coil portions that are wound in the slots as said first and second coil portions of said second coil.

15-18. (cancelled)